User's Manual

ITEM: Bridge Navigational Watch Alarm System

MODEL: BWAS-2000

Maker: B-I Industrial Co., Ltd.

B-I INDUSTRIAL CO., LTD.

Factory & Busan Office :

32, GongHang-ro 767 beonda-gail , Kangseo-gu, Pusan, Korea

TEL : (82-51)441-5670(REP), FAX : (82-51)441-6225

DNV Accredited by the RvA

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[History of Draft Version]

Ver.	Date	Descript of Draft Ver.
01	July 2011	Initial Manual

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1. General Information

1.1. Description

The purpose of a bridge navigational watch alarm system (BNWAS) is to monitor bridge activity and detect operator disability which could lead to marine accidents. The system monitors the awareness of the Officer of the Watch (OOW) and automatically alerts the Captain or another qualified OOW if for any reason the OOW becomes incapable of performing the OOW's duties.

This purpose is achieved by a series of indications and alarms to alert first the OOW and, if he is not responding, then to alert the Captain or another qualified OOW. Additionally, the BNWAS may provide the OOW with a means of calling for immediate assistance if required. The BNWAS should be operational whenever the ship's heading or track control system is engaged, unless inhibited by the Captain.

The BWAS-2000 system shall comply with IMO resolutions A.694(17), A.830(19), their associated international standard IEC 62616, IEC 60945, IEC 62288, IEC 61162 and MSC128(75).

1.2. Technical Description

1.2.1. Specification of BWAS-2000

The following Table 1.1 are specifications of the BWAS-2000 System.

Table 1.1 Specifications Description of BWAS-2000

Item		Description
Main Power (AC)		100~240Vac/ 50, 60Hz
Emergency Power (DC)		24Vdc (External DC Power)
Consumption Power		10 Watt's (below)
Operating Temperature		-20deg ~ +70deg
IP Grade (Enclosure)	BN2-M	IP44 (Installation Wheelhouse)
	BN2-RS	IP44 (Installation Wheelhouse, max. using 2ea)
	BN2-WS	IP66 (Installation Bridge Wings, max. using 2ea)
	BN2-AU	IP44 (Installation Captain's and Officer's Cabin, max. using 8ea)
Sensor Type		PIR Sensor (max. using 4 ea.)
Sensor Performance		Distance: 6m, Angle(Elevation and Azimuth): 60deg
External Serial Interface Input		Max. using 2ch. (refer to IEC 61162-1)
External Serial Interface Output		Max. using 2ch. (refer to IEC 61162-1)
Digital Input		Max. using 3ch. (Category-A Alarm, Emergency-call, Auto Pilot)

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1.2.2. Installation Considerations (IEC 62616, Annex A)

A.1 General

The following requirements are included in IMO resolution MSC.128(75) concerning the installation of the BNWAS.

A.2 Location of reset function

(128/A4.1.3.1) It shall not be possible to initiate the reset function or cancel any audible alarm from any device, equipment or system not physically located in areas of the bridge providing proper lookout.

A.3 Reset Facilities

(128/A5.1.4) Means of activating the reset function shall only be available in positions on the bridge giving proper look out and preferably adjacent to visual indications. Means of activating the reset function shall be easily accessible from the conning position, the workstation for navigating and manoeuvring, the workstation for monitoring and the bridge wings.

A.4 Visual indications

(128/A5.2.2 part) Flashing indications shall be visible from all operational positions on the bridge where the OOW may reasonably be expected to be stationed.

A.5 First stage bridge audible alarm

(128/A5.2.3 part) This alarm shall be audible from all operational positions on the bridge where the OOW may reasonably be expected to be stationed.

NOTE: Bridge includes wheelhouse and bridge wings.

[Alarm Sequence without acknowledgements]

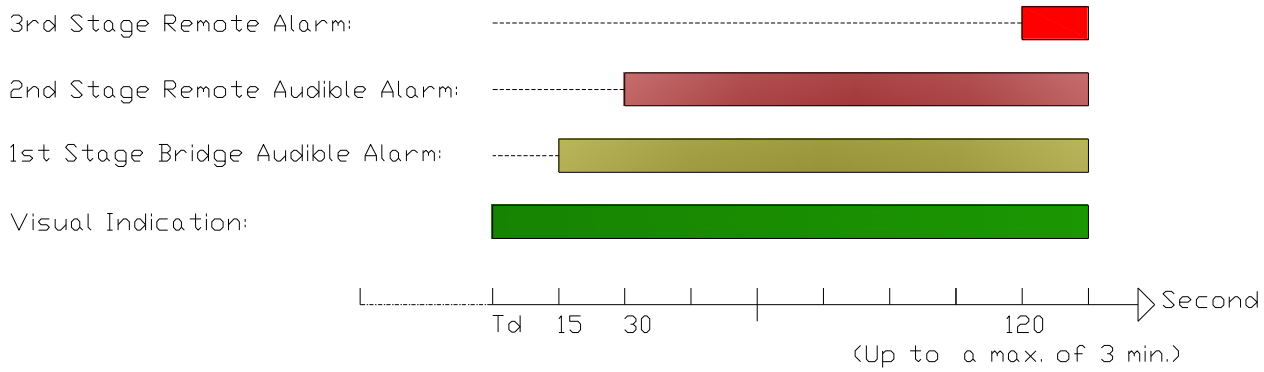

Fig. 1.1 Alarm Sequence without acknowledgements of BWAS-2000

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2. User Manual of BWAS-2000

2.1. 시스템 구성 (System Configuration)

BWAS-2000의 시스템 구성은 Main Panel, Motion Sensor, Reset Switch, Alaram Unit 등으로 구성 된다. 본 장치의 기능 설정(Set Mode and Function Select) 및 운용 상태 설정(Activated and Deactivated)은 접근 권한을 가진 사람(Usally Captain) 많이 할 수 있다. 이들 구성도는 아래 Fig.2.1 과 같다.

The BWAS-2000's system configuration is consist of Main Panel, Motion Sensor, Reset Switch, Ack. Unit and so on. A person(Usually Captain) who has access privileges only can set up Set Mode and Function Select & Activated and Deactivated of this device. The Configuation diagram is as below Fig.2.1

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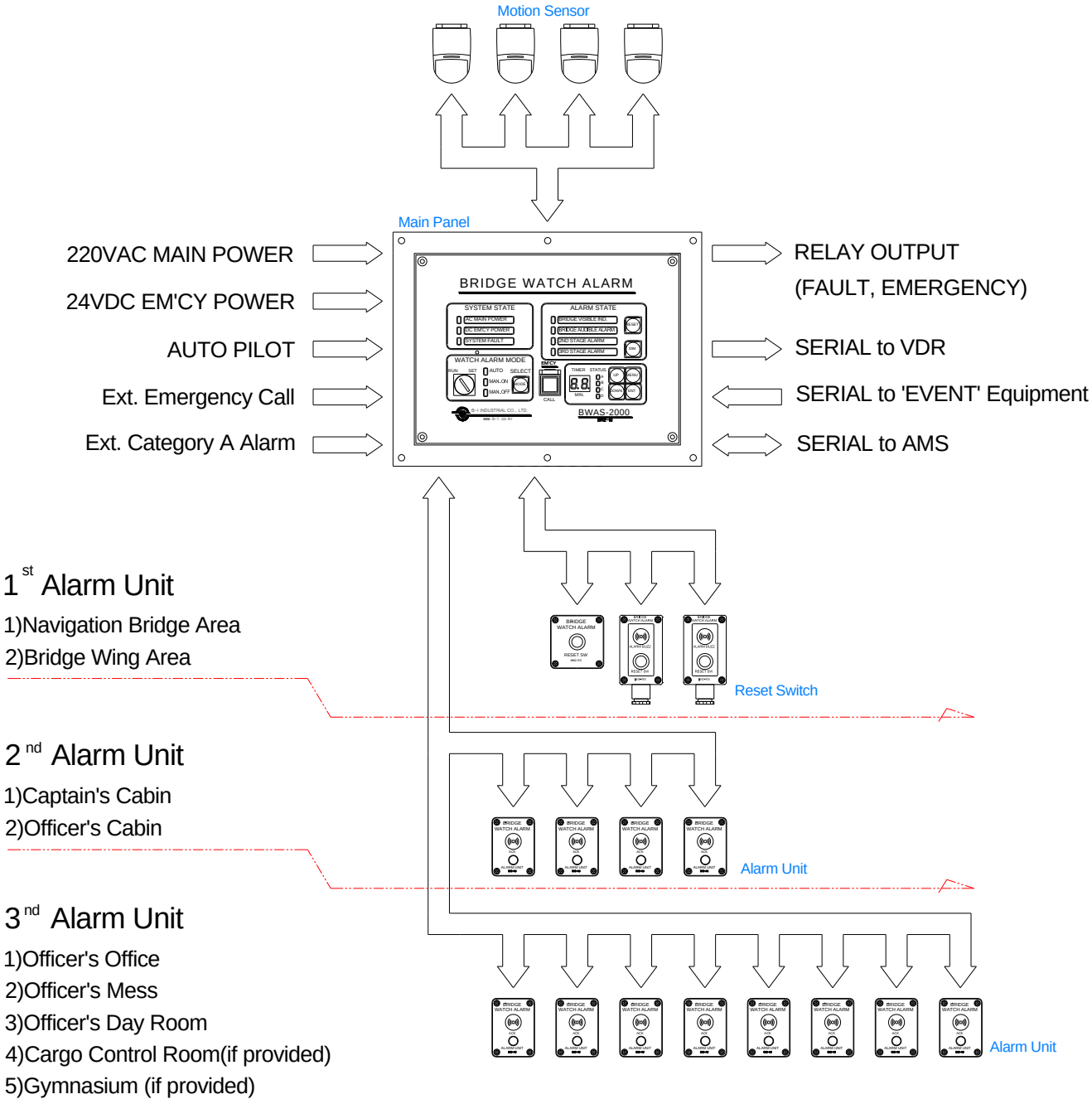

Fig. 2.1 System Configuration Diagram of BWAS-2000

2.2. 사용 설명(Operating Instructions)

2.2.1. Operating Units of BWAS-2000 System

BWAS-2000 시스템의 사용되는 장치는 Main Panel, Reset Switch (Wheelhouse and Bridge Wings), Alarm Unit, Motion Sensor, Junction Box 등으로 구성된다. 이들 장치는 Fig. 2.2 및 Table 2.1 과 같다.

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The device used for BWAS-2000 is consist of Main Panel, Reset Switch (Wheelhouse and Bridge Wings), Alarm Unit, Motion Sensor and so on. These devices are as bellow Fig.2.2 & Table 2.1.

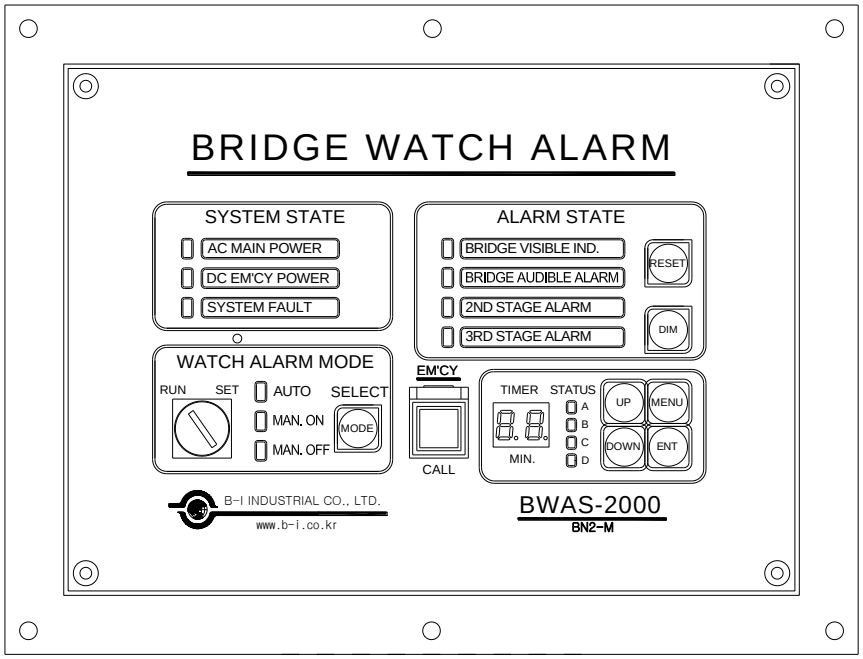
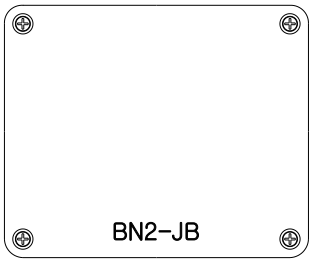
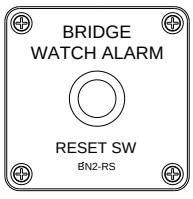
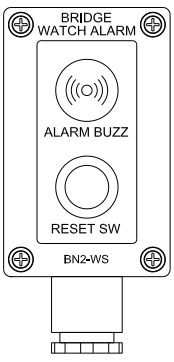
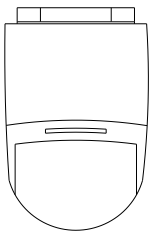
<table>
<tr><th>Main Panel</th><th>Alarm Unit</th></tr>
<tr><td rowspan="2"> 
</td><td>
</td></tr>
<tr><td>Junction Box</td></tr>
<tr><td rowspan="2"> 
</td></tr>
<tr><td colspan="2">Reset Switch</td><td rowspan="2">Motion Sensor</td></tr>
<tr><td>Wheelhouse Area</td><td>Bridge Wings Area</td></tr>
<tr><td> 
</td><td> 
</td><td>  </td></tr>
</table>

Fig. 2.2 BWAS-2000 System 에 사용 된 장치 구성품

Units of the BWAS-2000 System

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Table 2.1 BWAS-2000 System 에서 사용 되는 장치(Units)

Unit Name of the BWAS-2000 System

Item	Description	Remark
BN2-M	Main Panel in the Wheelhouse	
BN2-MS	Reset Switch in the Wheelhouse	
BN2-RS	Reset Switch in the Wheelhouse	
BN2-WS	Reset Switch at the Bridge Wings	
BN2-AU	Alarm Unit in the 2nd and 3rd Stage Area	only ACK

2.2.2. Reference Guide of BWAS-2000

1) Automatic Self Check (Alarm Unit and Sensor)

본 장치에 전원이 인가되면 자체적으로 저장되어 있는 정보를 불러온다. 따라서 장치를 처음 설치하거나 장치의 구성이 바뀌게 되면, 시간설정(VDR TIME) 및 장치 구성 재설정을 하여야 한다. 절차는 아래와 같다. 전원을 OFF 후 RESET KEY 를 누른 상태에서 전원을 인가한다. MENU KEY 를 누르면 아래와 같이 LED 의 위치가 변하게 되며, 그 위치에 따라서 UP, DOWN KEY 를 누르면, 시간을 설정할 수 있다.

The BWAS-2000 self-import an saved information when power is supplied.Therefore if units is first installed or changed component, you should re-set VDR TIME and units component. The procedure is as below.

After power is off, you supply the power with pushing RESET KEY. If you push MENU KEY then LED location will be changed, and according to the location if you push UP and DOWN KEY then you can set time.

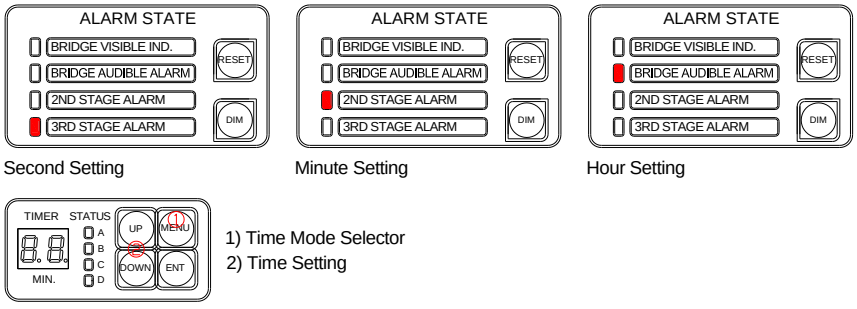

Fig. 2.3 Time Setting of the BWAS-2000

시간 설정이 끝나면 ENTER KEY 를 누르면 시간 설정이 완료된다.

After finish the setting time, push ENTER KEY then time set is completed.

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시간설정이 완료된 후 자체적으로 사용 되는 장치에 대한 재설정을 한다. 재설정을 하면 추가 되는 장비나 제거되는 장비가 저장이 되기 때문에, 반드시 재설정을 해야 한다.

After complete setting time, It will re-set the units used autonomously. Because it is saved added equipment or removed units after re-setting, you should reset.

먼저 BN2-AU 는 Main Panel 에서 CS 로 표시되고, 2nd Stage 및 3rd Stage 에 설치 된 Alarm Unit(BN2-AU)이 순차적으로 점검이 된다. (10 번은 'A', 11 번은 'b', 12 번은 'C'로 표기 됨)

At first, BN2-AU will be indicated as "CS" on a Main Panel and then Alarm UNIT(BN2-AU) installed for 2nd &3rd Stage will be checked in order. (no.10 is displayed 'A', no.11 is designated 'b' and no.12 is marked up 'C').

이후 SS 표시와 함께 Motion Sensor(BN2-MS)를 점검하는데, 연결된 순서에 따라서 S1, S2, S3, S4 가 점멸 후 꺼진다. 마지막으로 FND 가 88 로 표기하며 자체 점검을 마친 후 Watch Alarm Mode(Operational Mode)로 진입 한다.

After that, a Motion Sensor(BN2-MS) will be checked with SS displayed and according to connected order, S1, S2, S3 and S4 will be turned off after blinking. Finally, FND will be indicated as "88"on the main panel and after self-check it is enters into Watch Alarm Mode (Operational Mode).

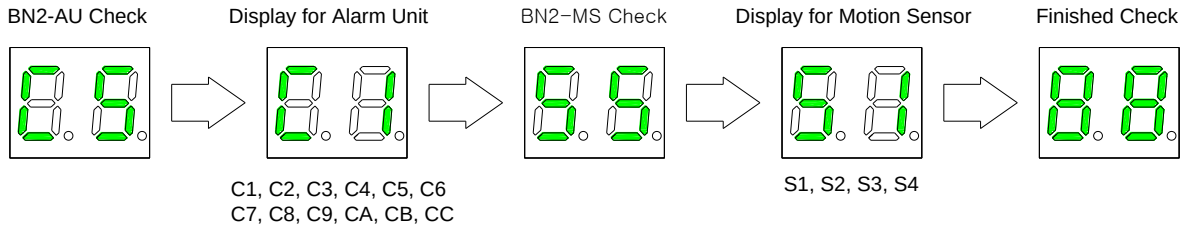

Fig. 2.4 Alarm Unit and Sensor Check of the BWAS-2000 System

2) 장치 조작 설명 (Operating and Setting of the using Units for BWAS-2000 System)

A. Main Panel (Unit Name: BN2-M)

A.1 Watch Alarm Mode

이 모드는 Watch Alarm Mode를 설정 할 수 있으며, 아래 Fig.2.5는 이에 대한 것이다. 다음은 Watch Alarm Mode 조작에 대한 설명이다.

This mode is used to set a Watch Alarm Mode and bellow Fig.2.5 is regarding for this. Bellow explanation is regarding for Operating of Watch Alarm Mode.

- SET and RUN: 이 장치의 설정 권한을 가진 사람(Usually Captain)이 ①의 운용 설정 Key(Operating Set Key)를 조작하여 장치를 설정 할 수 있다. 먼저 장치의 Key를 Set 방향으로 두면 Watch Alarm Mode 및 장치의 기능 설정을 행할 수 있다. 모든 설정을 마친 후 Key를 Run 방향으로 두면, 설정된 기능 들은 저장되고 Watch Mode로 동작 된다.

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A person(Usually Captain) who has setting privileges can set up after control an Operating Set Key of ①. First of all, the Watch Alarm Mode & Function Setting of device can be run if a key is turned to “SET”. . After finish all setting, if a the key is turned to “RUN”, then all the Set Function will be saved and operated to Watch Mode.

- Mode Select: 장치의 초기(Default) 상태는 Manual On 상태이며 ②의 Mode 버튼을 누르면 Automatic, Manual ON, Manual OFF로 변경 가능하고, 이는 Table 2.2에 상세히 설명 한다.

‘Manual On’ of the device means Default state and if you push a Mode button of ②, then it is possible to change to Automatic, Manual ON, Manual OFF. Please refer to details of Table 2.2.

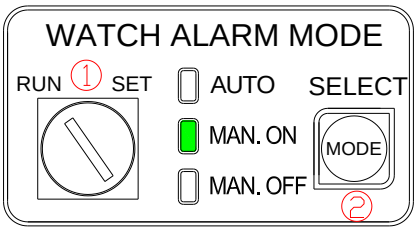

Fig. 2.5 Main Panel 의 Watch Alarm Mode

Table 2.2 Operational Modes Description of the BWAS-2000

Mode	Description	Remark
Auto	이 Mode는 외부의 Auto Pilot 신호에 의해 제어 (Control) 된다. 즉, 다음과 같이 동작 된다. This Mode is controled by Auto Pilot signal from outside. In other words, that will be run as bellow. Automatically brought into operation whenever the ship’s heading or track control system is activated and inhibited when this system is not activated.	
Manual ON	이 Mode는 본 장치에 대해 수동으로 조작을 할 수 있다. This Mode can operate manually for this device.	
Manual OFF	이 Mode는 장치를 Stand-by 상태로 유지 시킨다. This Mode can maintain the device as Stand-by status.	

** Note: The Automatic Mode is not suitable for use on a ship conforming with regulation SOLAS V/19.2.2.3 which requires the BNWAS to be in operation whenever the ship is underway at sea.

A.2 Alarm State

Alarm State는 Stage Alarm 상태 표시 및 Rest, Dimmer 기능 등을 조작할 수 있다. 아래 Fig.2.6는

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이에 대한 것이며, 다음은 이에 대한 설명이다. Alarm State is used to indicate Stage Alarm status and it can be operated the functions of Reset and Dimmer.

- Reset 버튼: ①의 Reset 버튼은 Watch Alarm의 Indications and Alarms 상태를 Reset 시켜 주며, 또한 장치에서 발생 된 Fault에 대해 ACK 응답을 할 수 있다.

The Reset Button of ① is used to reset the Indication and Alarms status of Watch Alarm and it can also "ACK" respond about happened fault from device.

- DIM 버튼: ②의 Dim 버튼은 Main Panel 및 Reset Switch, Lamp의 Dimmer 기능을 갖는다. 또한 이것은 DIM Switch 조작에 따라 단계적인 밝기 조정이 가능하다. The Dim button of ② on an Alarm State has a Dimmer function of Lamp about Main Panel & Reset Switch. And also it is used to adjust the brightness of dimmer according to operating DIM Switch.

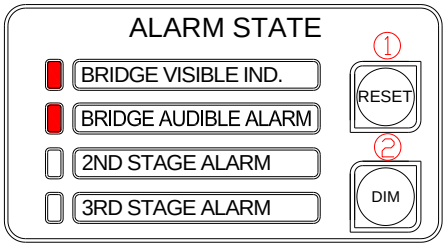

Fig. 2.6 Main Panel 의 Alarm State

Alarm State of the Main Pane

- Stage Alarm: Stage Alarm은 아래 Table 2.3에 각 단계에 따라 설명 하였다.

  A explanation of Stage Alarm is the following Table 2.2

Table 2.3 Operational Modes Description of the BWAS-2000

Mode	Description	Remark
Bridge Visible Ind.	휴지 시간(Dormant Period) 이후, 해당 Lamp가 깜빡 거리며, 응답이 없을 경우 15sec가 지난 후 다음 단계로 넘어 간다. After finish Dormant Period, the Lamp will flicker, if no reset it will be moved to the next step automatically after 15 seconds.	1st Stage Alarm
Bridge Audible Alarm	Visible Indicator 이후, Wheelhouse 내의 Alarm을발보 한다. 응답이 없을 경우 15sec가 지난 후 다음 단계로 넘어 간다. After a Visible Indicator is initiated, the Alarm in the Wheelhouse will sound. If no reset it will sound to the next step automatically after 15 seconds.	"

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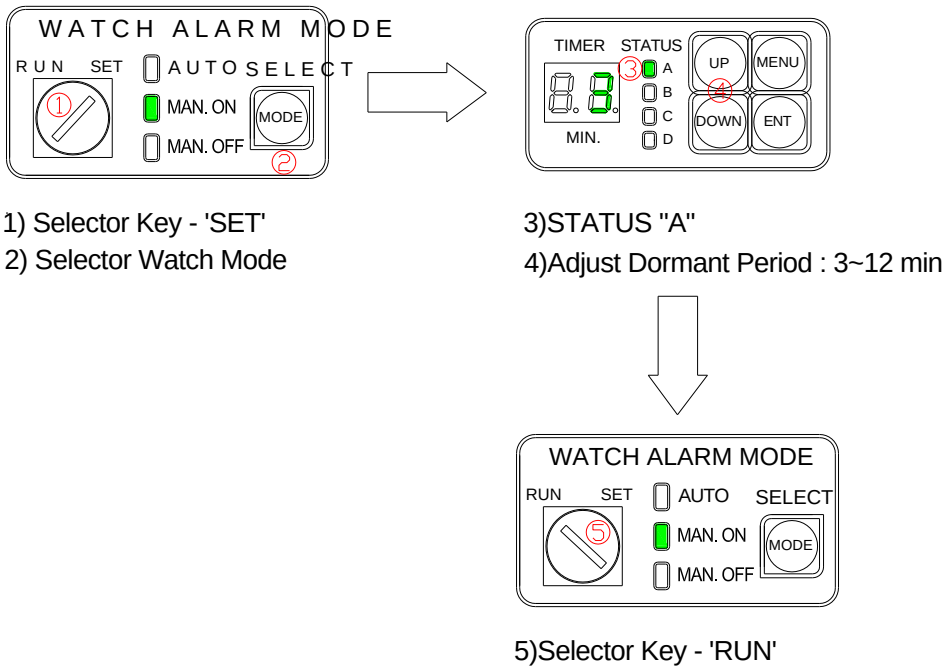
Mode	Description	Remark
2nd Stage Alarm	1st Stage Alarm 이후, 2nd Stage Area 내의 Alarm을 발보 한다. 응답이 없을 경우 1min 30sec가 지난 후 다음 단계로 넘어 간다. .(최대 3분까지 설정 가능하다) The Alarm of a 2nd Stage Area will sound after a 1st Stage Alarm is initiated. If no reset it will be moved to next stage automatically after 1 minute and 30 seconds. (it can be able to set Maximum 3 minuates.)	
3rd Stage Alarm	2nd Stage Alarm 이후, 3rd Stage Area 내의 Alarm을 발보 한다. The Alarm of a 3rd Stage Area will sound after a 2nd Stage Alarm is initiated.	

** Note: 2nd 및 3rd Stage Alarm Unit은 Alarm 상태에 대한 ACK 응답은 가능하나, Reset 기능은 하지 못 한다. 즉, Bridge 내의 Alarm 상태는 여전히 발보 상태에 있게 된다.

2nd and 3rd Stage Alarm Unit are possible to response for ACK in Alarm state, but it do not have an alarm reset function. It means that the Alarm in the bridge will sound until being reset.

Ex- Dormant Period Setting:



1) Selector Key - 'SET'
2) Selector Watch Mode
3)STATUS "A"
4)Adjust Dormant Period : 3~12 min
5)Selector Key - 'RUN'

Fig. 2.7 Main Panel 의 휴지 시간(Dormant Period) 설정 예제

Example for setting the Dormant Period of Main Panel

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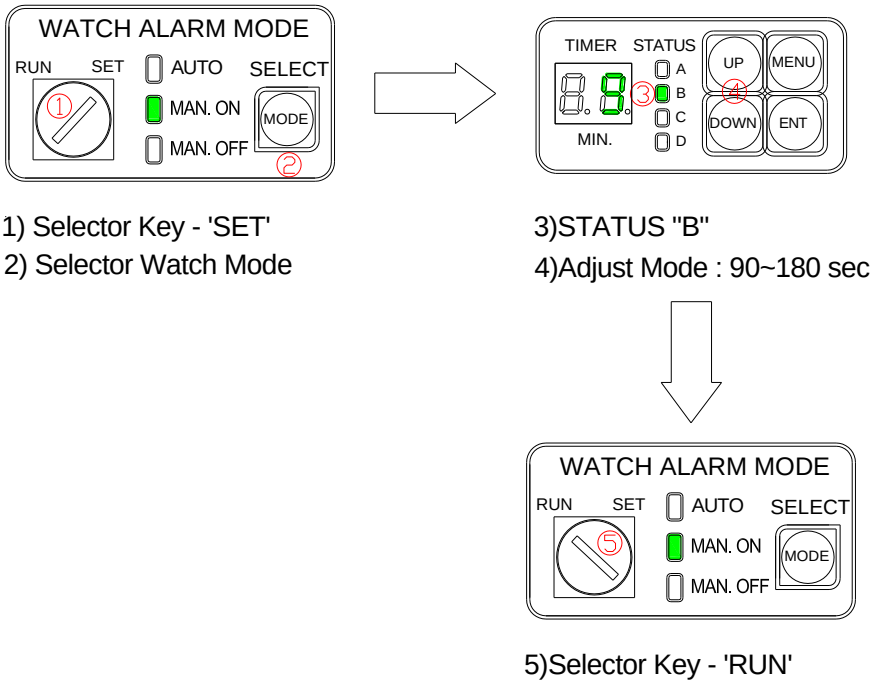
Ex- Between 2nd and 3rd Stage Alarm Timer Setting:



1) Selector Key - 'SET'
2) Selector Watch Mode
3)STATUS "B"
4)Adjust Mode : 90~180 sec
5)Selector Key - 'RUN'

Fig. 2.8 Main Panel의 2nd and 3rd Stage Alarm 사이의 시간 설정 예제

Example for Time setting of between 2nd and 3rd Stage Alarm of Main Panel

A.3 Timer Status

Timer Status는 기능 설정 및 상태 표시를 한다. 아래 Fig. 2.9은 이것에 대한 그림이며, 다음은 이에 대한 설명이다.

Timer Status is used to set Function and indicate State. Bellow Fig. 2.8's photo is regarding for this, and please refer to bellow the explanation for this.

- 상태표시 창(Status Display Window) ①: 상태 표시는 Timer 및 설정 기능, FAULT에 대해 ①의 상태 표시 창에서 나타낸다.

It is used to indicate on ①'s Status Display Window the function of Timer & Setting and Fault.

- Status LED ②: 이는 4개의 메뉴를 나타낸다. MENU KEY를 누르면 A → B → C → D 순서로 이동한다.

It is used to display four menu modes. If pressing a Menu Key, status LED will be moved 누르면 A → B → C → D in order.

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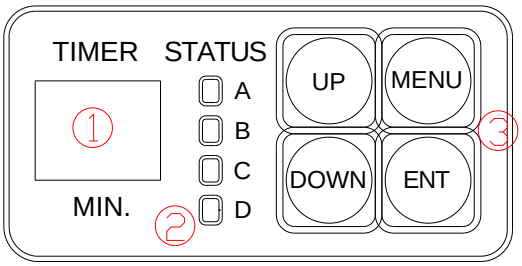

Fig. 2.9 Main Panel 의 Timer Status

Timer Status of Main Panel

- Menu Mode ③: Menu Mode 는 본 장치의 기능을 설정하며, 이들의 설명은 Table 2.4 와 같다.
  It is used to set functions of Main device, please refer to bellow explanation of Table 2.4.

Table 2.4Operational Modes Description of the BWAS-2000

Menu Mode	Description	Remark
A	Dormant Period를 설정 할 수 있다. 이 모드 상태에서 UP, DOWN Key를 누르면 3~12분까지 시간 설정을 할 수 있다. It is used to set the Dormant Period and if push UP & DOWN Key then it can set the time from 3 ~12 minutes.	
B	이 기능은 2nd 와 3rd Stage 사이의 Alarm 시간을 설정 한다. 이 모드 상태에서 UP, DOWN Key를 누르면 9(90초)~18(180초) 까지 설정 할 수 있다. It is used to set the Alarm between 2nd and 3rd Stage and it also can set the time 90~180 seconds of the duration by pressing UP & DOWN Key.	
C	이 기능은 Sound Modulation 과 Alarm Alternative로서 동작 된다. 먼저 Sound Modulation은 Up, Down Key를 이용하여 3가지 (단음, 중음, 장음) 형태로 변조가 가능하다. 그리고 Alarm Alternative는 ENT Key를 이용하여 2nd 및 3rd stage Alarm에 대해 구분 및 하나로 묶을 수 있다. . It is used to operate Sound Modulation and Alarm Alternative. At first, Sound Modulation is possible to be modulated to three types of sound (short, middle and long) by a Up & Down button. And Alarm alternative can be divided into two separate 2nd & 3rd stage alarm or combined into one united by ENT button.	1. Sound Mod.: Up, Down Key 2. Alarm Alternative: ENT Key

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Menu Mode	Description	Remark
D	Backup Officer를 설정하는 기능이다. 초기 상태는 OFF 이고, UP, DOWN KEY를 누르면 1C ~ 4C 까지 하나를 설정 할 수 있다. 설정된 Officer는 2nd Stage Alarm으로 설정이 되고 나머지는 전부 자동으로 3rd Stage Alarm으로 설정 된다. It is used to set a function for Backup Officer. Initial state is OFF, it can be set one among 1C~4C by pushing UP & DOWN Key. . Selected Officer is set for 2nd Stage Alarm, the reset of alarm units will be automatically set for a 3rd Stage Alarm.	BN2-AU: 1C, 2C, 3C, 4C (OFF: 1C~4C 모두 2nd Stage Alarm)

A.4 System State

이는 BWAS-2000 System의 상태를 확인 할 수 있으며, Fig. 2.10는 이것에 대한 그림이다. 그리고 이것의 상세 설명은 다음과 같다.

It is used to check the state of BWAS-2000, please refer to bellow Fig. 2.10 and detail explanation for this.

- AC MAIN POWER : Main 220VAC 전원의 인가 유무를 확인 할 수 있다. 전원이 켜져 있으면 녹색 Lamp에 불이 켜지게 되고, 전원이 꺼지면 Lamp가 꺼지게 된다.

It is used to indicate if main power 220VAC is being supplied. If main power is ON, a green lamp will be turned on. On the other hand, if not, it will turned off.

- DC EM'CY POWER : EMERGENCY DC전원 인가 유무를 확인 할 수 있다. 전원이 켜져 있으면 녹색 Lamp에 불이 켜지게 되고, 전원이 꺼지면 Lamp가 꺼지게 된다.

It is used to indicate if emergency power is being supplied. If emergency power is ON, a green lamp will be turned on. On the other hand, if not, it will turned off.

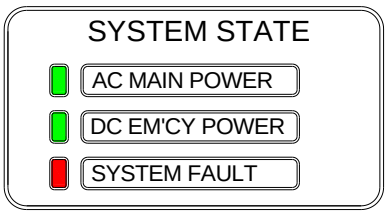

Fig. 2.10 Main Panel 의 System State

System State of Main Panel

- SYSTEM FAULT : Supply Power(AC, DC), Motion Sensor, Alarm Unit, 통신 등의 이상 유무를 확인 할 수 있다. 만약 본 장치가 고장 발생 시 System Fault에 Lamp 점등 및 Fault Alarm을 발보하고, 상태 표시 창에 해당 고장에 대해 표기하게 된다.

It is used to indicate if supply power(AC or DC), Motion Sensor, Alarm Unit, communication are abnormal. If the BWAS-2000 is out of order, System Fault lamp will be turned on and Fault Alarm will sound, it will be

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indicated the fault on the Status Display Window.

Table 2.5 Fault Alarms Description of the BWAS-2000

Menu Mode	Description
Supply Power	주 전원(220VAC) 및 Emergency 전원 (+24VDC)이 인가되지 않을 때 In case main power(220VAC) & Emergency power (+24VDC) are not supplied.
Motion Sensor	Wheelhouse 내의 Motion Senor의 응답 신호가 없을 시 발생 In case a motion sensor in the Wheelhouse does not have any response signal.
Communication	BN2-AU 및 외부 Interface 인 AMS 장치와 통신이 두절 시 발생 In case communication with BN2-AU & external AMS is interrupted.

A.5 (Internal) EM'CY Call

Bridge 내의 긴급 상황이 발생 될 경우 누르는 스위치로, Main Panel 및 BN2-RS, BN2-WS, BN2-AU (2nd and 3rd Stage Alarm)에 Alarm 과 부저가 동시에 울리게 된다. 그런데 3rd Stage Alarm은 Alarm Sequence 와 동일하게 2nd Stage Alarm 발보 후 1분 30초 뒤에 울리게 된다.

In case of emergency in the bridge, you are required to press EM'CY Call, which will make a main panel, BN2-RS, BN2-WS, BN2-AU (2nd and 3rd Stage Alarm) give an alarm simultaneously. However, 3rd Stage Alarm will be sounded 1 minute and 30 seconds after 2nd Stage Alarm is initiated same with Alarm Sequence.

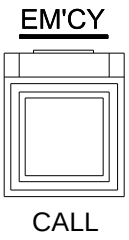

Fig. 2.11 Main Panel 의 Emergency Call Switch

Emergency Call Switch of Main Panel

B. Reset Switch

B.1 Wheelhouse(Unit Name: BN2-RS)

본 장치는 Wheelhouse 내에 설치 되고, Main Panel에서 1st Stage의 Visible Alarm 이 발보되면 BN2-RS도 연동되어 동작 된다. Fig.2.12은 이에 대한 장치이다.

The BN2-RS installed inside the wheelhouse will be operated to be interlocked if a Visible Alarm of 1st Stage sounds on the Main Panel. Please refer to bellow Fig. 2.12 regarding for this.

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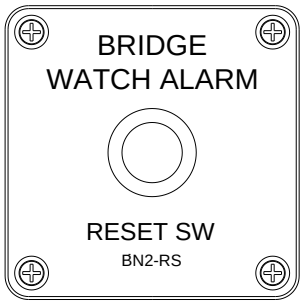

Fig. 2.12 Wheelhouse 내의 Reset Switch (BN2-RS)

Reset Switch (BN2-RS) inside of a Wheelhouse

B.2 Bridge Wings(Unit Name: BN2-WS)

본 장치는 Bridge Wings에 설치 되고, Main Panel에서 1st Stage Visible Alarm 및 Audible Alarm이 발보되면 BN2-WS도 연동되어 동작 된다. Fig.2.13는 이에 대한 장치이다. The BN2-WS installed inside the Bridge Wings will be operated to be interlocked if a 1st Stage Visible Alarm and Audible Alarm sound on Main Panel. Please refer to Fig. 2.12 regarding for this.

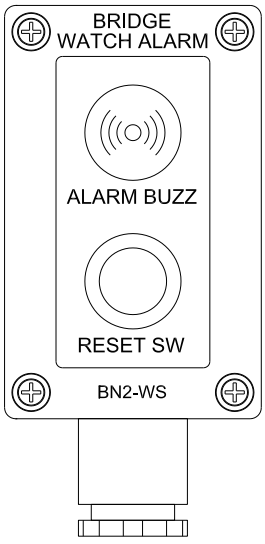

Fig. 2.13 Bridge Wings 의 Reset Switch (BN2-WS)

Reset Switch (BN2-WS) of Bridge Wings

C. Alarm Unit (Unit Name: BN2-AU)

본 장치는 2nd 및 3rd Stage Alarm Area 내에 설치 되며, 2nd Stage 와 3rd Stage Alarm은 서로 구분되어 동작 된다. 동작은 Main Panel에서 해당 Stage Alarm에 대한 Lamp가 켜진 뒤, 2nd Stage

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Alarm 발보 이후 1분 30초 뒤에 3rd Stage Alarm이 발보 된다. 그리고 이들 장치는 Rest 기능 동작은 하지 못하고, 다만 Alarm 상태에 대해 ACK 응답만 할 수 있다. Fig.2.14는 이에 대한 그림이다.

An alarm unit (BN2-AU) is installed in 2nd and 3rd Stage Alarm Area, 2nd and 3rd Stage Alarm is operated respectively. The Stage Alarm Lamp is initiated on Main Panel, the 3rd Stage Alarm will be sounded 1 minute 30 seconds after 2nd Stage Alarm is initiated. This device can not operate Rest function, it just can "ACK" respond about Alarm status. This unit is the following Fig.2.14.

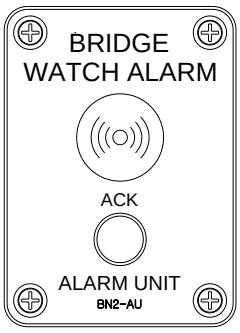

Fig. 2.14 2nd and 3rd Stage (Captains and Officers) Alarm Area 내의 Alarm Unit (BN2-AU)

Alarm Unit (BN2-AU) inside 2nd and 3rd Stage (Captains and Officers) Alarm Area

D. Motion Sensor (Unit Name: BN2-MS)

본 장치는 Main Panel의 Reset Switch 기능 과 같고 Wheelhouse 내에 설치 된다. Motion Sensor의 성능은 감지 거리(Detection Distance)가 6m 이상이고, 감지 각(Detection Angle at Elevation and Azimuth)이 60deg 이상이다. 이것의 동작은 Wheelhouse 내의 항해 당직사관에 대한 움직임(최소 0.5 m/s 이상 이동)을 Sensor가 감지하여 작동되고, 이는 Main Panel의 Reset 기능으로 동작 된다. Fig.2.15는 이에 대한 그림이다.

A motion sensor (BN2-MS) installed in the wheelhouse is same with Reset Switch function of Main Panel. The efficiency of Motion Sensor is 6m over Detection Distance, 60deg over Detection Angle at Elevation and Azimuth. In operation, The Sensor will perceive and operate automatically the moving(at least 0.5 m/s over) of navigation officer in the Wheel house. This unit is the following Fig.2.15.

** Please refer to specification and installation

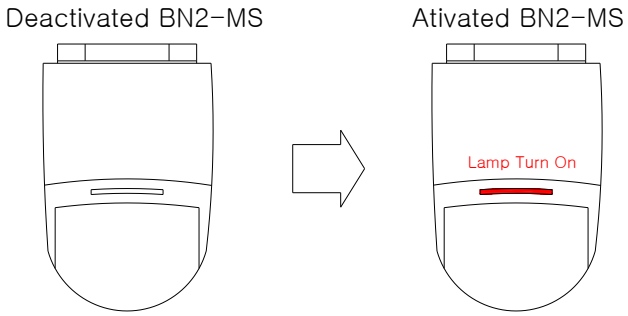

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Fig. 2.15 Wheelhouse 내의 Motion Sensor (BN2-MS)

Motion Sensor (BN2-MS) inside Wheelhouse

2.2.3. 장치의 Interfacing 설명

DESCRIPTION INTERFACING OF UNITS

1) General

The interface is available on RS422/485 as standard with a communication speed of 4800 bits/s, 8 data bits, no parity and one stop bit.

- Baud rate : 4800
- Data bit : 8
- Parity : none
- Stop bits : 1

2) VDR Interface Protocol (only Tx)

A. Data Protocol

$BNALR, hhmmss.ss, xxx, A, A, c--c *hh<CR><LF>

0 1 2 3 4 5 6

Table 2.6 Data Protocol Description of 'ALR' Sentence for the BWAS-2000

No.	Description
0	Header
1	Event time
2	Mode status '000' : Auto Mode '001' : Manual On '002' : Manual Off
3	Alarm condition 'A': Activation 'V': Deactivation
4	Acknowledge state 'A': Acknowledged 'V': UnAcknowledged

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No.	Description
5	Alarm description text
6	End of sentence

B. The Data Sentence

- '$' : Hex 21 – Start of sentence
- <Massage> : Valid characters, data fields are separated with ','
- *hh : '*' and checksum field, the checksum hh is calculated from '$' to '*'

('$' and '*' not included)

- <CR><LF> : End of sentence

B-1) Stage Alarm Description

C1=xxx ; C2=xx ; C3=x

0 1 2

Table 2.7 Stage Alarm Description of 'ALR' Sentence for the BWAS-2000

No.	Description
0	Mode Status 'AUT' : Auto Mode 'MAN' : Manual ON Mode 'OFF' : Manual OFF Mode
1	Dormant Period Time
2	Alarm Stage '1' : 1st Stage Alarm '2' : 2nd Stgae Alarm '3' : 3rd Stage Alarm

Table 2.8 Stage Alarm Text List of 'ALR' Sentence for the BWAS-2000

Stage Alarm	Sentence
1st stage alarm	$BNALR,hhmmss.ss,001,A,V,C1=MAN;C2=03;C3=1*hh<CR><LF>
2nd stage alarm	$BNALR,hhmmss.ss,001,A,V,C1=MAN;C2=03;C3=2*hh<CR><LF>
3rd stage alarm	$BNALR,hhmmss.ss,001,A,V,C1=MAN;C2=03;C3=3*hh<CR><LF>

Table 2.9 Fault Alarm Text List of 'ALR' Sentence for the BWAS-2000

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Stage Alarm	Sentence
AC fault	$BNALR,hhmmss.ss,001,A,V,AC_POWER_FAULT*hh<CR><LF>
DC fault	$BNALR,hhmmss.ss,001,A,V,DC_POWER_FAULT*hh<CR><LF>
Sensor1 fault	$BNALR,hhmmss.ss,001,A,V,SENSOR1_FAULT*hh<CR><LF>
Sensor2 fault	$BNALR,hhmmss.ss,001,A,V,SENSOR2_FAULT*hh<CR><LF>
Sensor3 fault	$BNALR,hhmmss.ss,001,A,V,SENSOR3_FAULT*hh<CR><LF>
Sensor4 fault	$BNALR,hhmmss.ss,001,A,V,SENSOR4_FAULT*hh<CR><LF>
Alarm unit1 Fault	$BNALR,hhmmss.ss,001,A,V,ALARM_UNIT1_FAULT*hh<CR><LF>
Alarm unit2 Fault	$BNALR,hhmmss.ss,001,A,V,ALARM_UNIT2_FAULT*hh<CR><LF>
Alarm unit3 Fault	$BNALR,hhmmss.ss,001,A,V,ALARM_UNIT3_FAULT*hh<CR><LF>
Alarm unit4 Fault	$BNALR,hhmmss.ss,001,A,V,ALARM_UNIT4_FAULT*hh<CR><LF>
Alarm unit5 Fault	$BNALR,hhmmss.ss,001,A,V,ALARM_UNIT5_FAULT*hh<CR><LF>
Alarm unit6 Fault	$BNALR,hhmmss.ss,001,A,V,ALARM_UNIT6_FAULT*hh<CR><LF>
Alarm unit7 Fault	$BNALR,hhmmss.ss,001,A,V,ALARM_UNIT7_FAULT*hh<CR><LF>
Alarm unit8 Fault	$BNALR,hhmmss.ss,001,A,V,ALARM_UNIT8_FAULT*hh<CR><LF>
normal	$BNALR,hhmmss.ss,001,V,V,NORMAL*hh<CR><LF>

3) Event Equipment Interface Protocol (only Rx)

A. Data Protocol

$--EVE, hhmmss.ss, c—c, c--c *hh<CR><LF>

0 1 2 3 4

Table 2.10 Data Protocol Description of ‘EVE’ Sentence for the BWAS-2000

No.	Description
0	Header, Event Equipment
1	Event time
2	Tag code used for identification of source of event
3	Event description
4	End of sentence

** Notice: Event Sentence는 고객이 요청하는 장치에 맞게 Sentence 작업이 필요 함.

Event Sentence is required Sentence work according to a clients’ requirements.

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B. The Data Sentence

- '$' : Hex 21 – Start of sentence
- <Massage> : Valid characters, data fields are separated with ','
- *hh : '*' and checksum field, the checksum hh is calculated from '$' to '*' ('$' and '*' not included)
- <CR><LF> : End of sentence
- Example Sentence:

$RAEVE,hhmmss.ss,BNWAS,Operator activity*hh<CR><LF>

4) AMS(Alarm Monitoring System) Interface Protocol

4-1) Input(ACK) Sentence

A. Data Protocol

$--ACK, XXX *hh<CR><LF>

0 1 2

Table 2.11 Data Protocol Description of 'ACK' Sentence for the BWAS-2000

No.	Description
0	Header
1	Unique alarm number(identifier) at alarm source
2	End of sentence

B. The Data Sentence

- '$' : Hex 21 – Start of sentence
- <Massage> : Valid characters, data fields are separated with ','
- *hh : '*' and checksum field, the checksum hh is calculated from '$' to '*' ('$' and '*' not included)
- <CR><LF> : End of sentence
- Example Sentence:

$INACK,010,hh<CR><LF>

4-2) Output(ALR) Sentence

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본 장치가 AMS 로 보내는 ALR Sentence 는 BWAS-2000 의 현재 상태 및 Alarm List 를 보내게 된다. 여기서 Alarm List 는 약 1 분 마다 AMS 로 보내게 된다. Alarm List 의 내용은 Table 2.8 및 Table 2.9 를 참고 한다.

ALR sentence transmitted to AMS includes Alarm List and current state of BWAS-2000. In addition, alarm list will be transmitted to AMS every 1 minute. For the details of alarm list, please refer to the following Table 2.8 & 2.9.

A. Data Protocol

$BNALR, hhmmss.ss, xxx, A, A, c--c *hh<CR><LF>

0 1 2 3 4 5 6

Table 2.12 Data Protocol Description of 'ALR' Sentence for the BWAS-2000

No.	Description
0	Header
1	Event time
2	Mode status '000' : Auto Mode '001' : Manual On '002' : Manual Off
3	Alarm condition 'A': Activation 'V': Deactivation
4	Acknowledge state 'A': Acknowledged 'V': UnAcknowledged
5	Alarm description text
6	End of sentence

B. The Data Sentence

- '$' : Hex 21 – Start of sentence
- <Massage> : Valid characters, data fields are separated with ','
- *hh : '*' and checksum field, the checksum hh is calculated from '$' to '*'

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('$' and '*' not included)

- <CR><LF> : End of sentence

4) Digital Contact Interface

4-1) Input

A. Auto Pilot

BWAS-2000 System 에서 Watch Alarm Mode 가 AUTO 로 되어 있고, 선박의 Auto Pilot 입력(Digital Contact)에 따라 다음 과 같이 구동 된다.

Watch Alarm Mode of BWAS-2000 System is selected 'Auto' mode, it's a automatically activated according to the autopilot signal (Digital Contact signal) in the vessel, it is operated as below;

- Digital Contact ON (Auto Pilot): Watch Alarm 이 Auto Mode 로 구동 된다.
  Watch Alarm is operated as Auto Mode.
- Digital Contact OFF (Auto Pilot): Watch Alarm 이 Stand-by Mode 로 구동 된다.
  Watch Alarm is operated as Stand-by Mode.

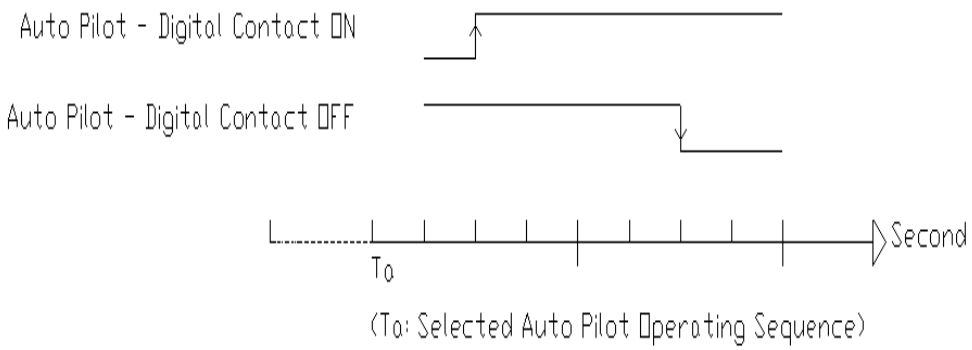

Fig. 2.16 Auto Pilot Operating Status according to Digital Contact

B. External Category A Alarm

갑작스럽게 선박의 위급 상황 인 Category A Alarm (배의 좌초 및 충돌)이 발생 시, 외부 장치로부터 Category A Alarm 에 대한 입력(Digital Contact)을 받고, 본 장치는 다음 과 같이 구동 된다.

When ship's emergency situation suddenly happens, the category-A alarm(grounding and collision of the ship)I, it receives the Digital Contact to Categoru-A alarm from external equipment and it is operated as below;

- Digital Contact ON : BWAS-2000 은 Emergency Alarm 을 발보 한다. 만약 본 장치에서 Reset 을 누르게 되면, 본 장치의 Alarm 소리는 꺼지게 된다. 그러나 Category A Alarm 상태는 상황 해지가 되지 않는다.
  BWAS-2000 is operate as emergency alarm. The alarm is turned off by pressing Reset. But the category-A alarm will not be revoked.

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- Digital Contact OFF: Watch Alarm 이 Stand-by Mode 로 구동 됨.

Watch Alarm is operated by Stand-by Mode.

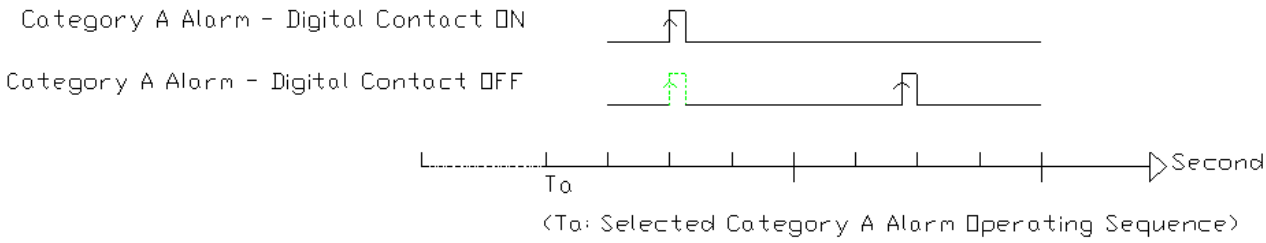
Category A Alarm - Digital Contact ON
Category A Alarm - Digital Contact OFF
Second
To
(To: Selected Category A Alarm Operating Sequence)

Fig. 2.17 Category A Alarm Operating Status according to Digital Contact

C. External Emergency Call

갑작스럽게 선박의 Emergency 상황이 발생 되고, 외부 장치에 의해 Emergency Call 입력(Digital Contact)을 받게 되면, 본 장치는 다음과 같이 구동 된다.

When Emergency situation occurs, it receives Emergency Call Digital Contact from external equipment then it is operated as below;

- Digital Contact ON : Watch Alarm 이 자동 Reset 으로 구동 됨.

Watch Alarm is operated by Auto Reset.

- Digital Contact OFF: Watch Alarm 이 Stand-by Mode 로 구동 됨.

Watch Alarm is operated by Stand-by Mode.

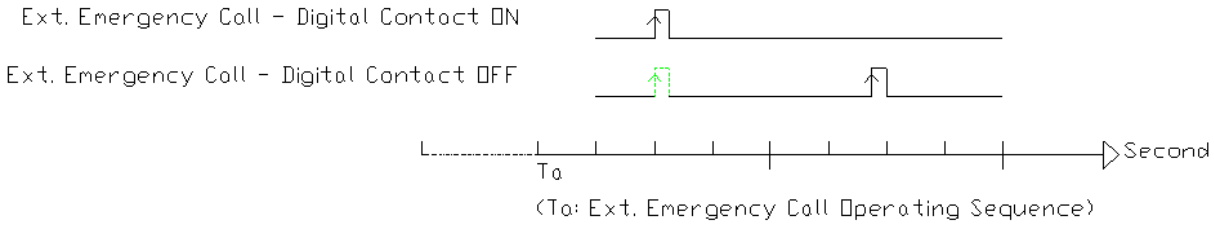
Ext. Emergency Call - Digital Contact ON
Ext. Emergency Call - Digital Contact OFF
Second
To
(To: Ext. Emergency Call Operating Sequence)

Fig. 2.18 Ext. Emergency Call Operating Status according to Digital Contact

4-2) Output

만약 사용자가 이 기능을 원치 않으면, 외부 장치에 결선(Cable Wiring)을 하지 않으면 된다.

If user does not want to have this function, just disconnect cable to the external equipment.

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A. Fault Alarm (if provided)

BWAS-2000 장치가 내부 Fault Alarm 이 발생 시, 이를 외부 장치로 출력(Digital Contact)을 보낼 수 있다. 본 장치의 구동은 다음 과 같다.

When the BWAS-2000 occurs internal Fault Alarm, it can transmit the Digital Contact to external equipment and it is operated as below;

- Digital Contact OFF : BWAS-2000 이 장치 이상 없이 정상 동작 될 경우 신호 OFF 상태.
  BWAS-2000 normally operates without any problems, the signal is OFF.
- Digital Contact ON: BWAS-2000 이 장치 이상(Fault Alarm) 발생 시, 신호 ON 상태.
  BWAS-2000 occurs Fault Alarm, the signal is ON.

B. Internal Emergency Call (if provided)

BWAS-2000 장치가 Emergency Call 을 발생 시, 이를 외부 장치로 출력(Digital Contact)을 보낼 수 있다. 본 장치의 구동은 다음 과 같다.

When BWAS-2000 occurs Emergency Call, this can transmit the Digital Contact to external equipment and it is operated as below;

- Digital Contact OFF : BWAS-2000 이 정상 동작 될 경우 신호 OFF 상태.
  BWAS-2000 is normally operated, the signal is OFF.
- Digital Contact ON: BWAS-2000 이 Emergency Call 발생 시, 신호 ON 상태.
  BWAS-2000 occurs Emergency Call, the signal is ON.

2.3. Trouble Shooting

전원, 사용 장치, 통신, 센서가 고장 및 이상 증상이 발생하면 BWAS-2000의 Main Panel에서 System Fault Lamp(①) 및 화면 표시(②)에서 Fault에 대해 표시 하고 Fault Alarm을 발보 한다. 이때 RESET KEY (③)를 누르면 Alarm의 소리는 꺼지게 할 수 있다. Fault Alarm은 문제 해결이 되기 직전까지 System Fault (①)를 지속하며, Fault List에 대한 화면(②) 확인은 Up, Down – KEY (④)를 눌러 FAULT 항목을 확인 할 수 있다.

When supply power, using units, communications and sensor are abnormal or out of order, Main Panel of BWAS-2000 shows System Fault Lamp(①) and Display(②) shows Fault and Fault Alarm is sounded. In this time, if press RESET KEY(③), you can turn off the Alarm sound. The Fault Alarm The System Fault (①) is lasted until the problem is resolved. To check Fault List on the display(②), press Up, Down – KEY (④).

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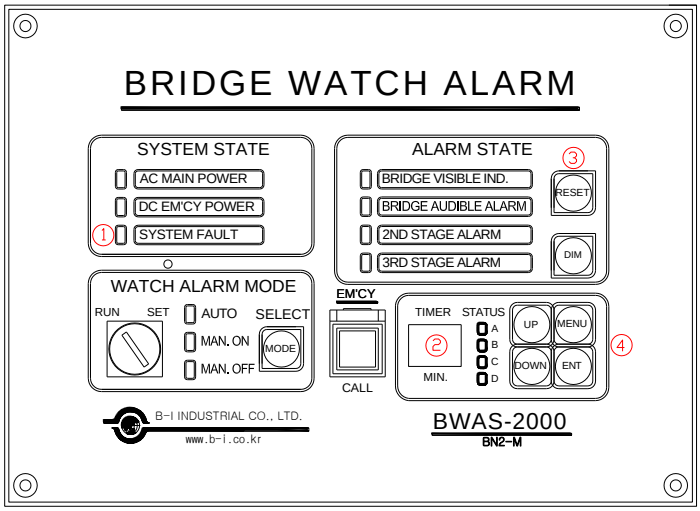


Fig. 2.19 Main Panel 의 Fault Alarm 표시 및 확인

Display and check of Fault Alarm on Main Panel

2.3.1. 사용 장치의 고장 Failure of Operation units

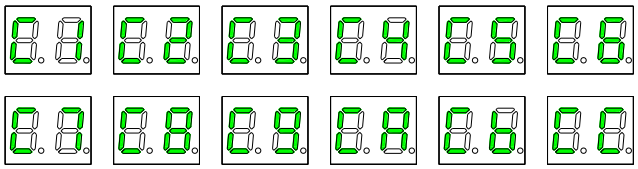
A. 사용 장치(BN2-AU)의 고장

Failure of operating units(BN2-AU)

사용 장치(BN2-AU)의 고장 및 통신을 하지 못하는 경우, Main Panel에서 System Fault Lamp 및 화면 표시(②)에서 Fault에 대해 표시 하고 Fault Alarm을 발보 한다. 화면 표시는 아래 Table 2.13과 같이 해당 장치의 Alarm에 대해 표시 한다.

If BN2-AU is out of order and failed in communications, Main Panel shows System Fault Lamp and Fault on window display(②) and the Fault Alarm is sounded. The Window Display shows the Alarm of this units as bellow Table 2.13.

Table 2.13 Fault Alarm Description of BN2-AU

Presented Indication	Description	Remark
	1번부터 12번까지 통신 Failure (10번은 'A', 11번은 'b', 12번은 'C'로 표기) From No.1 to No.12 communication Failure (Displaying No.10 to 'A', No.11 to 'b', No.12 to 'C')	

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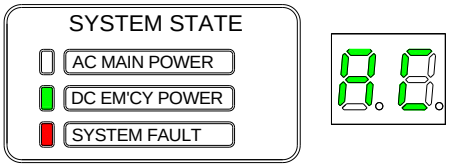
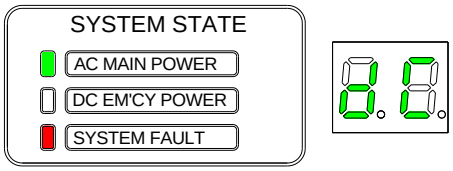
2.3.2. 전원 고장 Power Failure

BWAS-2000 System의 공급 전원의 고장이 발생 하였을 경우, Main Panel에서 System Fault Lamp 및 화면 표시(②)에서 Fault에 대해 표시 하고 Fault Alarm을 발보 한다. 화면 표시는 아래 Table 2.14와 같이 해당 장치의 Alarm에 대해 표시 한다.

When Power Failure of BWAS-2000 System occurs, Main Panel shows System Fault Lamp and Fault on window display(②) and Fault Alarm is sounded. The Window Display shows the Alarm of this units as bellow Table 2.14.

Table 2.14 Fault Alarm Description of Power Supply

Presented Indication	Description	Remark
	Main Power 220VAC Failure	AC 전원(케이블 포함) 상태 확인, 만약 이상 없을 시 제조사에 문의 Check AC power state (with cable), if no problem, then contact to manufacture.
	DC Emergency Power 24VDC Failure	Emergency DC 전원(케이블 포함) 상태 확인, 만약 이상 없을 시 제조사에 문의 Check Emergency DC power state (with cable), if no problem, then contact to manufacture.

2.3.3. 센서 고장

Wheelhouse 내에 설치 된 Motion Sensor의 고장이 발생 하였을 경우, Main Panel에서 System Fault Lamp 및 화면 표시(②)에서 Fault에 대해 표시 하고 Fault Alarm을 발보 한다. 화면 표시는 아래 Table 2.15와 같이 해당 장치의 Alarm에 대해 표시 한다.

When the Motion Sensor installed Wheelhouse is failed, Main Panel shows System Fault Lamp and Fault on window display(②) and Fault Alarm is sounded. The Window Display shows the Alarm of this units as bellow Table 2.15.

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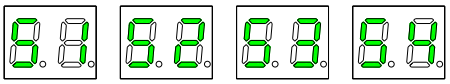
Table 2.15 Fault Alarm Description of Power Supply

Presented Indication	Description	Remark
	Wheelhouse 내에 설치 된 Sensor Sensor inside Wheelhouse	Sensor의 정면에 Lamp 깜박임 확인, 깜박임이 없을 시 제조사에 문의 Check flashing of the Lamp in front of the Sensor. If the lamp does not flash, then contact to manufacture.

2.4. 점검 및 보수 주기 Inspection and Maintenance Cycles

2.4.1. 유지보수 Maintenance & Repair

시스템의 유지보수는 본 장치를 설치 후 1년간 고장 및 이상 증상에 대해 A/S를 무상으로 처리 한다. 다만, 사용자의 부주의에 의해 발생 되는 장비 파손은 이에 해당하지 아니한다.

. System Maintenance & Repair is free of charge for A/S for 1 year since its installation. However, the maintenance for damages caused by users is not accepted as free of charge.

2.4.2. 시스템 정기 점검 및 교정 주기 System Regular Inspection and Calibration

시스템의 정기 점검 및 교정 주기는 본 장치를 설치 후 1 년에 1 회 사용 되는 장치들의 정상 동작 유무를 확인 할 수 있다. 본 장치의 정상 동작에 대한 점검은 당사(B-I 산업)의 전문 Engineer 및 본 장치에 대해 교육을 받은 Engineer 가 실시 하도록 한다.

다음 Table 2.16 은 정기 점검 항목 이다.

You can check whether the normal operation of units or not once a year after installation for system regular inspection and calibration. Only engineers in B-I industrial co., Ltd. and trained engineers by B-I industrial Co., Ltd. are qualified for the System Inspection and Calibration. The Regular Inspection List as bellow Table 2.16.

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Table 2.16 BWAS-2000 시스템의 정기 점검 항목

Regular Inspection List of BWAS-2000 System

Item		Check (O: OK, X: Fail)	Remark
Automatic Self Test			Please refer to '2.2.2' .
Main 220VAC			AC Main Lamp
Emergency 24VDC			DC EM'CY Lamp
Watch Alarm Mode	Auto		
	Man. ON		
	Man. OFF		Stand-by
Menu-A			Please refer to '2.2.2'
Menu –B			
Menu –C			
Menu –D			
Fault Alarm			Please refer to '2.3.1'

그리고 Table2.17 는 정기 교정 항목 이다.

And the Regular Calibration List as bellow Table 2.17.

Table 2.17 BWAS-2000 시스템의 교정 항목

Table 2.17 Calibration List of BWAS-2000 System

Calibration List		Result	Remark
Detection Distance of BN2-MS			
Detection Angle of BN2-MS			
Detection Time of BN2-MS			
Alarm Sequence			Please refer to '1.3'.
Operating Watch Alarm	1st Stage Alarm		Visible, Audible Alarm
	2nd Stage Alarm		After 15sec
	3rd Stage Alarm		After 1min 30sec

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3. Installation

3.1. 장비 설치 (Equipments Installation)

3.1.1. Main Panel (BN2-M)

Main Panel 은 Wheel House 내에 설치 되며, 적절한 위치(항해당직자 접근이 용이한 장소)를 선정하여 설치 한다. 도면은 아래 Fig. 3. 1과 같다.

Main Panel is installed in Wheel House, it is also installed after select the suitable site (the place which is Navigation watcher easy to access). Drawing is as below Fig. 3.1.

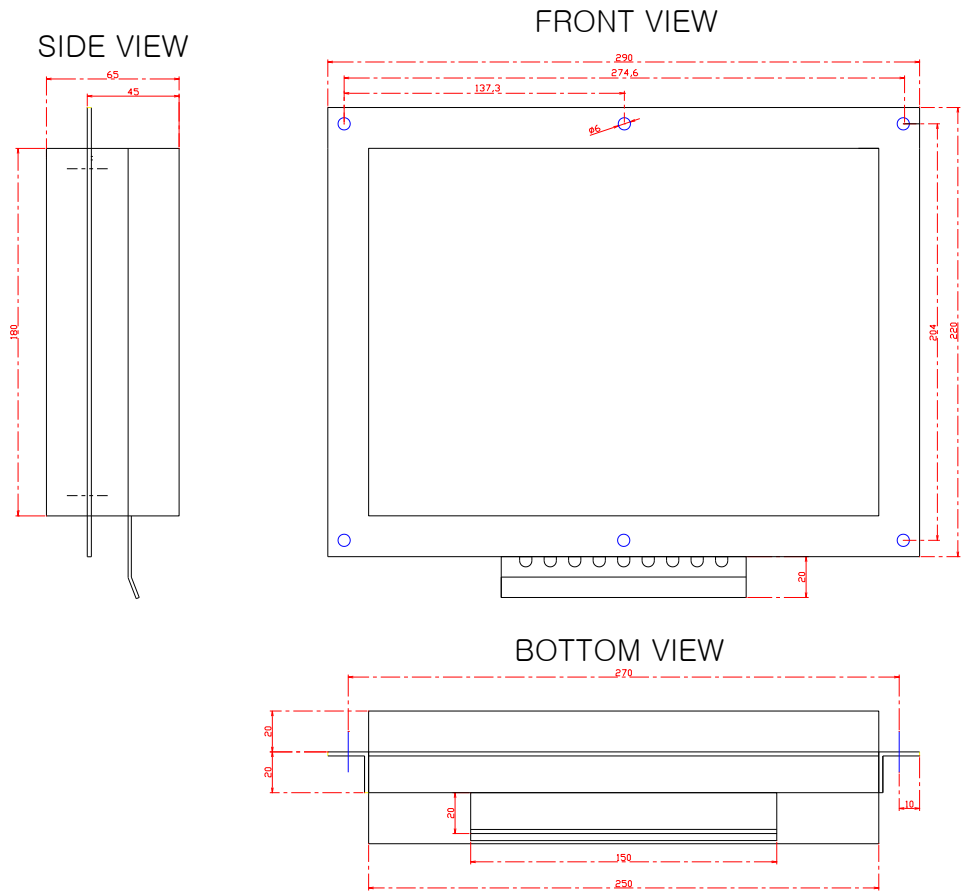

Fig. 3.1 Main Panel Case

3.1.2. Reset Switch (BN2-RS, BN2-WS)

Reset Switch는 Wheel House 에 설치되는 (BN-RS), Wing Bridge 우현과 좌현에 설치되는 (BN2-WS)가 있다. BN2-RS 는 Wheel house 내부, 항해당직자의 접근이 용이하고, 눈에 잘 띄는 위치를 고려하여 설치 한다. (Main Panel과 중복될 경우, Main Panel에도 똑같은 기능의 Reset Switch가 있으므로, 사용자에

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따라 설치 하지 않을 수도 있다.)

BN2-WS 는 PORT & STB'D Wing Bridge에 설치되고, 항해 당직자의 접근이 용이하고, 눈에 잘 띄는 위치에 설치해야 한다. 보편적으로 Wing Bridge Anneouncing Remote Panel 이 설치된 주위에 설치하면 된다.

Reset Switch is installed to Wheel House (BN-RS) and Wing Bridge Area's starboard and portside (BN2-WS). BN2-RS is installed to consider the Inner part of Wheel house, Easy to access of Navigation watcher and easily Visible site. (If it is duplicated with Main Panel, the Reset Switch of same function is on the Main Panel, so it don't need to be installed according to user.) BN2-WS is installed in PORT & STB'D Wing Bridge and easy to access of Navigation watcher and easily Visible site. Generally BN2-WS is installed around installed Wing Bridge Anneouncing Remote Panel.

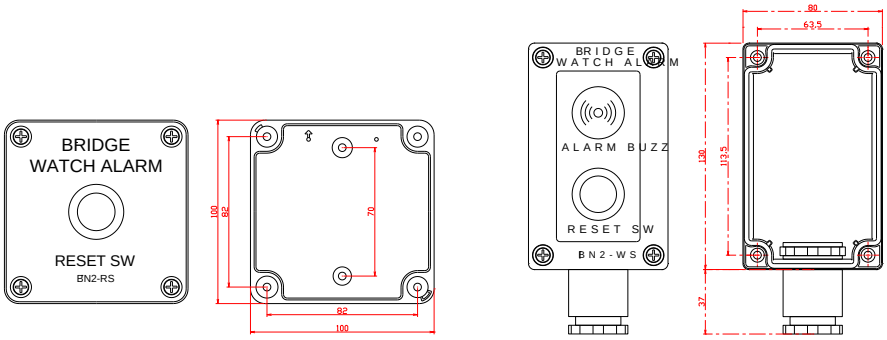

Fig. 3.2 Reset Switch, Wing Reset Switch Case

3.1.3. Alarm Unit (BN2-AU)

Alarm Unit는 2nd Stage (Captain Cabine, 1/O, 2/O, 3/O), 3nd Stage (Mess Room, Ship's Office) 에 설치되고, 가능한 한 접근이 용이하고, 시각적으로 눈에 잘 띄는 곳에 위치해야 한다.

Alarm Units is installed in each 2nd Stage (Captain Cabine, 1/O, 2/O, 3/O), 3nd Stage (Mess Room, Ship's Office) Alarm area. It is also should be installed the site which is easy to access and easily visible.

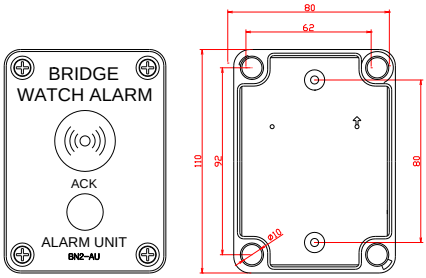

Fig. 3.3 Alarm Unit Case

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3.1.4. Junction Box (BN2-JB)

Junction Box 내부에는 터미널 단자대가 있으며, 4개의 단자가 병렬로 연결되어 있다. 1개 이상의 Alarm Unit이 설치 될 경우 Junction Box를 이용하여, Cabling을 간략하게 할 수 있다.

Terminal port is inside Junction Box, it is connected with four terminals as parallel. If you install over one Alarm Unit, you can make the Cabling more simple using Junction Box.

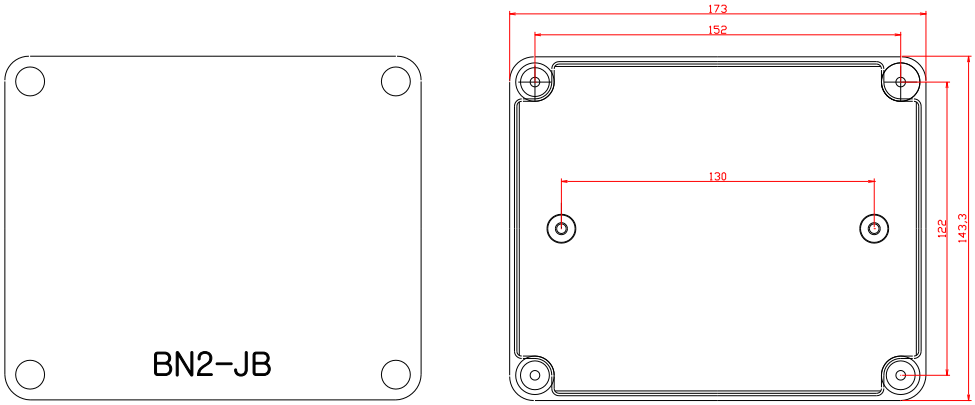

Fig. 3.4 Junction Box Case

3.1.5. Motion Sensor (BN2-MS)

H103. Means for activating the BNWAS reset function provided at workstation for monitoring, workstation for navigating & manoeuvring and workstation for conning shall be activated by automatic detection of human motion. (DNV Rules for Ships/ Pt.6 Ch.8 Sec.6)

다음은 Wheelhouse 내에서 항해 장교(OOW)가 항해 감시를 할 수 있는 전체 영역(Whole Coverage)에 대해 감지(Detection)가 가능 하도록 Motion Sensors의 설치 방법에 대해 설명토록 한다. 먼저 Fig.3.5은 Wheelhouse 내에서 Motion Sensor가 설치 가능한 위치에 대해 설명하였고, Table3.1은 Motion Sensor 의 설치 표준에 대해 제조사가 제안하는 성능 이다. 그리고 Fig.3.6는 Motion Sensor를 천정 면에 고정 후, 감지 성능(Detection Performance)을 조정(Adjust)할 수 있는 설치 각도(Installation Angle)의 조정 방법(Adjust Method)에 대한 것 이다.

This is about Motion Sensor Installation to detect the whole coverage where the OOW watches in Wheelhouse.

Fig.3.5. describes the area where the Motion Sensor can be installed in Wheelhouse, Table 3.1 is efficiency suggested by the manufacturer, B-I Industrial Co., Ltd. about Motion Sensor's Installation Standard.

Fig.3.6 shows the adjustment method of installation angle to adjust detection performance of the Motion Sensor fixed on the ceiling.

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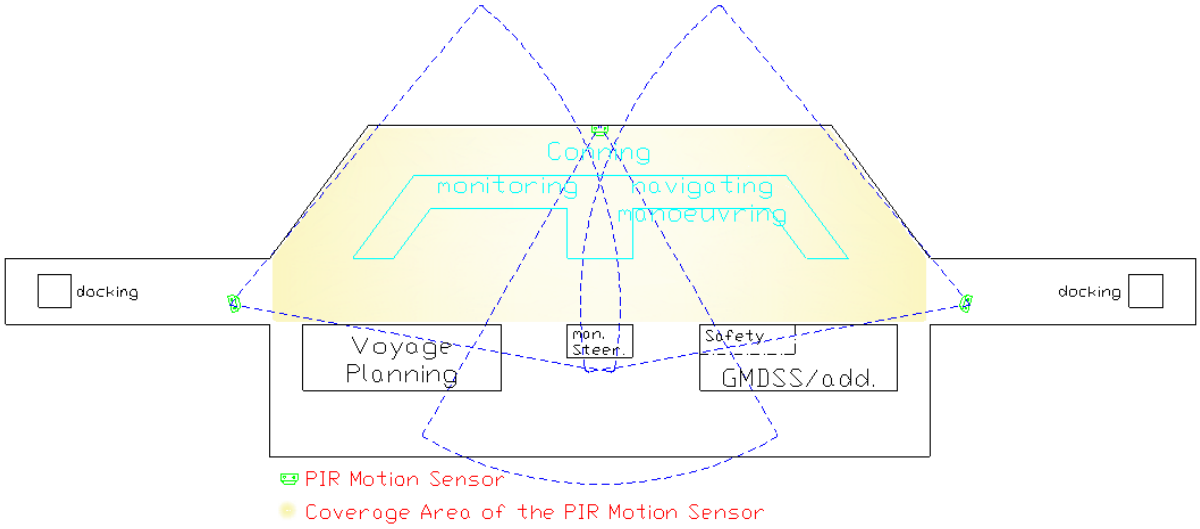

Fig. 3.5 Installation diagram of the motion sensors in a wheelhouse

(Motion Sensor 는 최대 4ea 까지 확장 가능하며, 이들의 적절한 조합으로 항해 감시를 할 수 있는 전체 영역을 커버가 가능 하다.)

(You can install up to 4ea of Motion Sensors to cover the whole area of sailing watch with proper combination of the sensors.)

Table 3.1 Recommend Specification of the Motion Sensor

Item	Description	Remark
Distance	6m	
Angle	Azimuth: 60deg, Elevation: 60deg	
Response Time	2 sec	

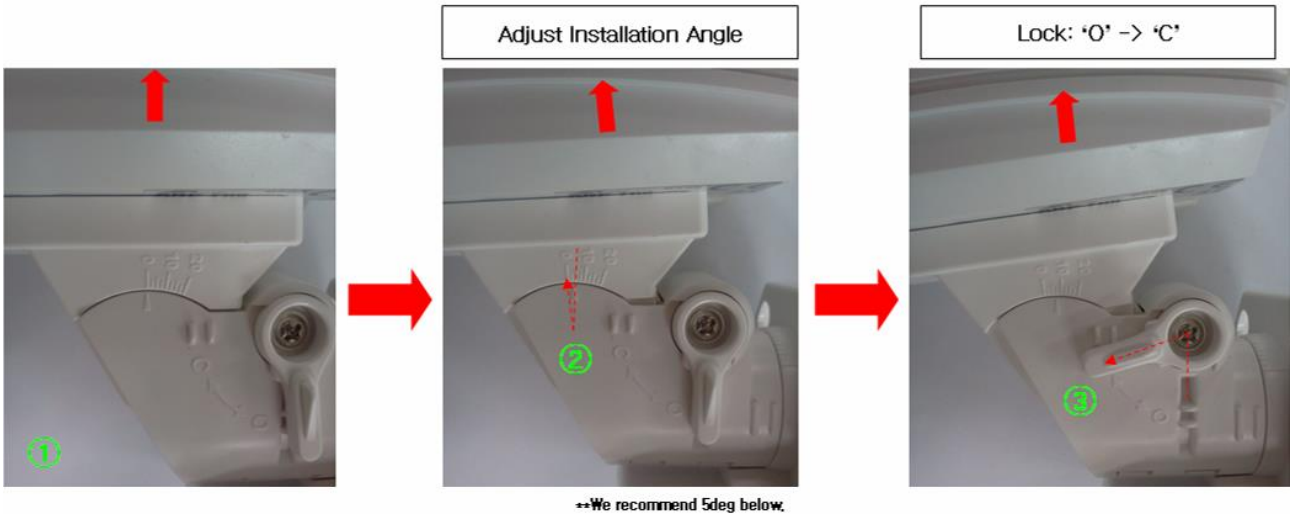

Fig. 3.6 Installation method on 천정 면 of the motion sensor

The Installation method of Motion Sensor Installation on Ceiling

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Motion Sensor 설치 참조

Refering to Installation of Motion Sensor

Fig. 3.7 Motion Sensor 설치 예

Example for Installation of Motion Sensor

3.1.6. 전선 포설 (Cabling)

사용되는 Cable의 사양은 첨부된 Wiring Diagram(BWAS-2000) 을 참고하여 준비하고, UNIT 별로 포설한다.

각 Unit 의 결정된 설치위치를 기준하여, 내장제등 취외 후, 전로(Cable Gland, Coamming, Hanger등)부터 먼저 작업 한다. 전로 작업 완료 후, Main Unit 에서 시작하여 각 Unit로 포설하고 Cable Name Tag를 취부하여, 식별이 가능 하도록 해야 한다.

Lan Cable 은 가능 한 한 타 Cable 과 이격시켜, 유해한 Noise로 부터 보호해야 한다.

포설된 Cable은 Cable Tie, Band 등으로 Binding(300~500mm 간격) 하여야 하고,

Cable Gland, Cable Coaming 은 Compound 등 수밀 처리를 하여 마감 한다.

The specification of used Cable is prepared to refer to Wiring Diagram(BWAS-2000) and lay on the cable every Unit.

Base on desided Install site for each Unit, after take off interior material etc. and then at first you operate electric (Cable Gland, Coamming, Hanger etc.) work.

After working of an electric, you have to lay on from Main Unit to each Units and it should be possible to distinguish after attach a Cable Name Tag on there.

If possible, you have to divide a Lan Cable from other Cable to protect harmful Noise.

Laid Cable should be bound(space out from 300 to 500mm) with Cable Tie, Band etc., and Cable Gland, Cable Coaming have to be bolted up after water tight processing covered with Compound etc.

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3.2. 장비 결선 Equipment Connection

3.2.1. BWAS-2000 의 전체적인 결선 Entire connection of BWAS-2000

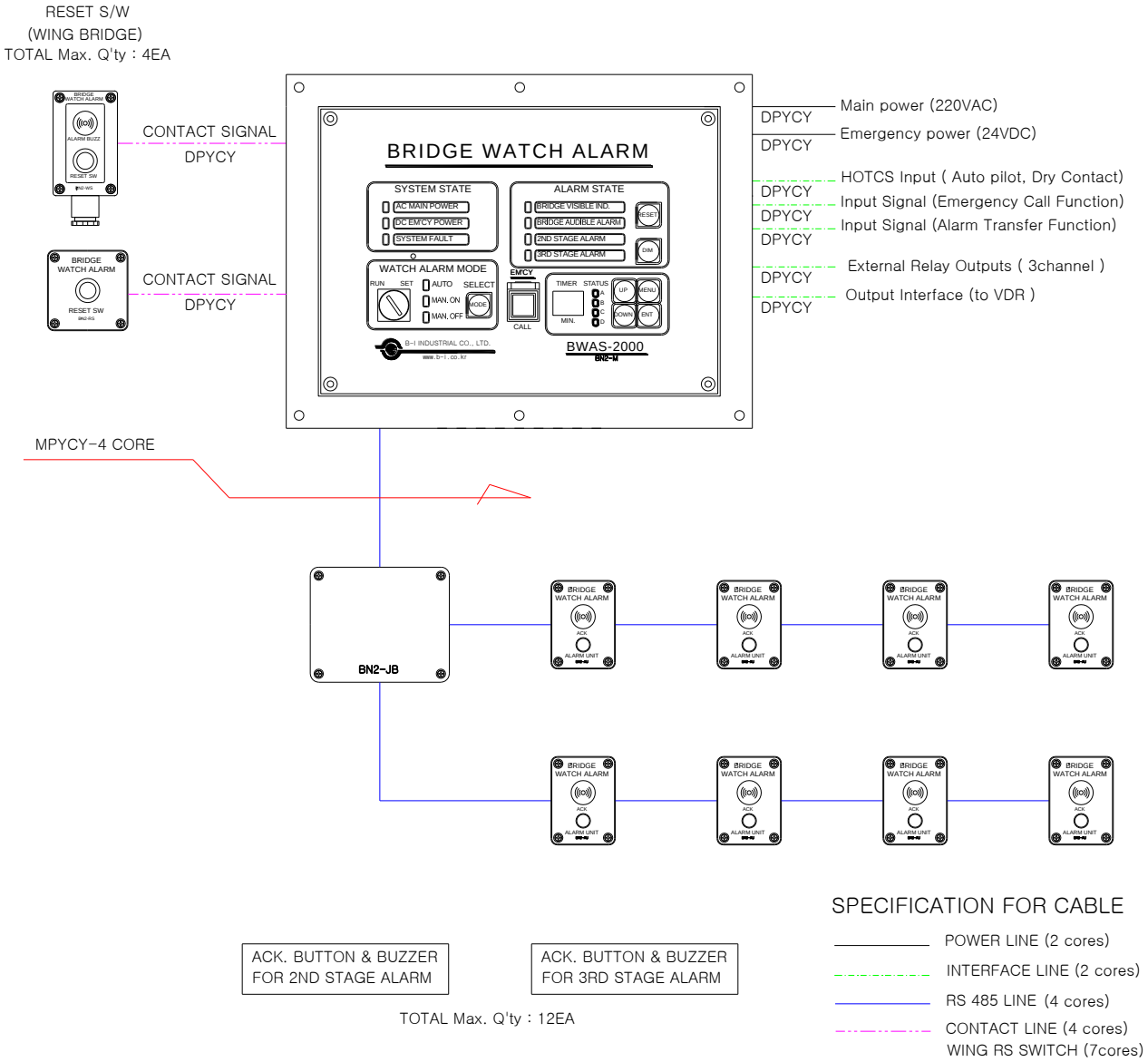

Fig. 3.8 BWAS-2000 전체적인 결선도

Entire connection diagram of BWAS-2000

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3.2.2. Main Panel 의 Terminal Board **Terminal Board of Main Panel**

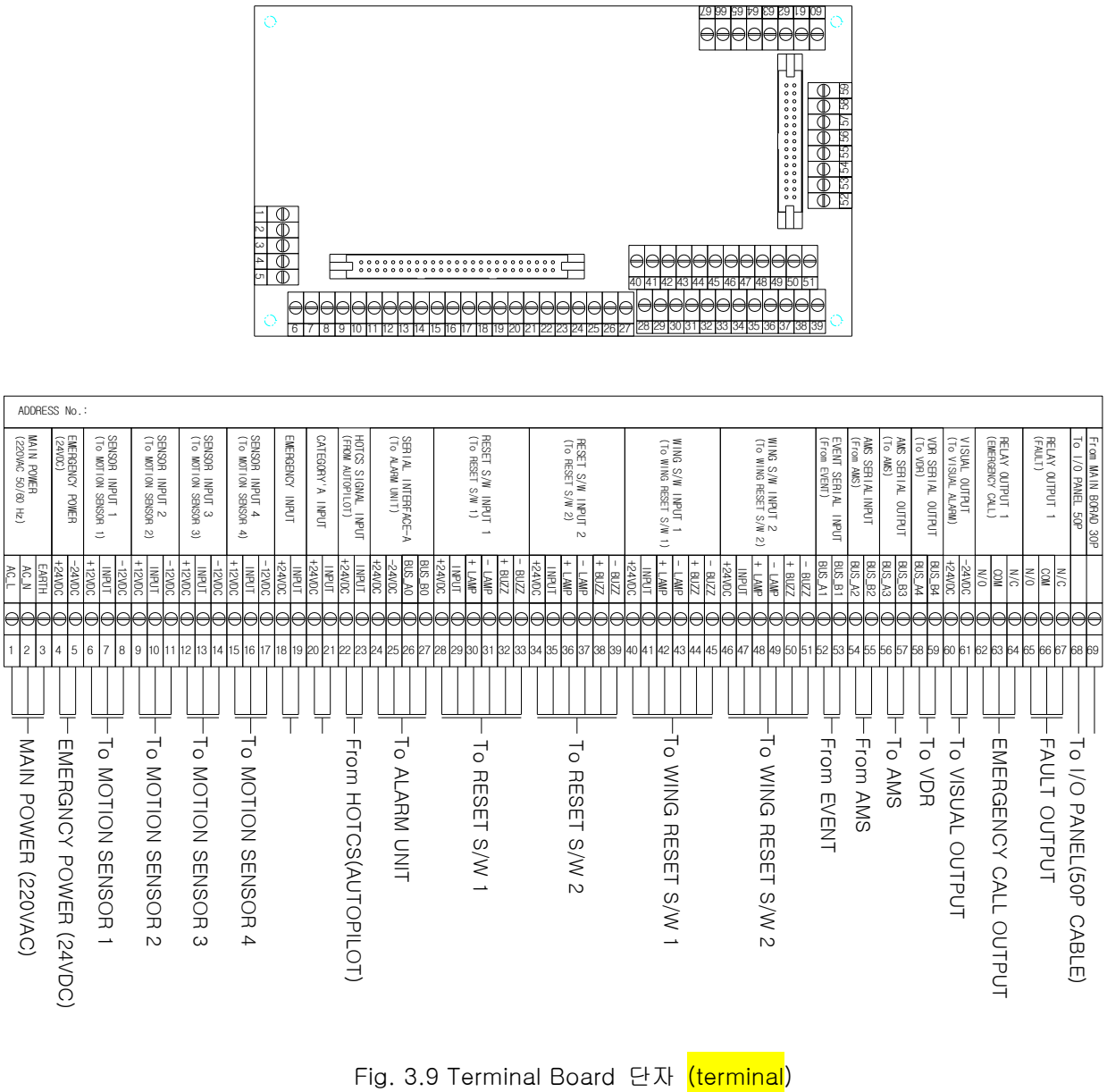

Fig. 3.9 Terminal Board 단자 (terminal)

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3.2.3. Alarm Unit

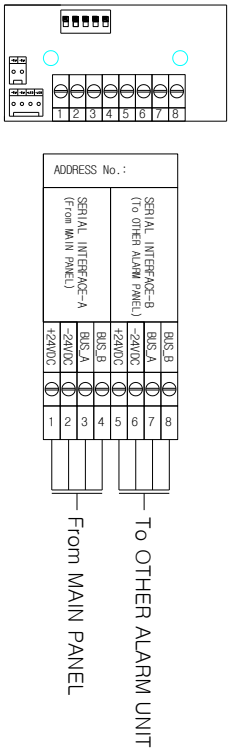

Fig. 3.10 Alarm Unit Board 단자 (terminal)

3.2.4. Wing Reset Switch, Reset Switch

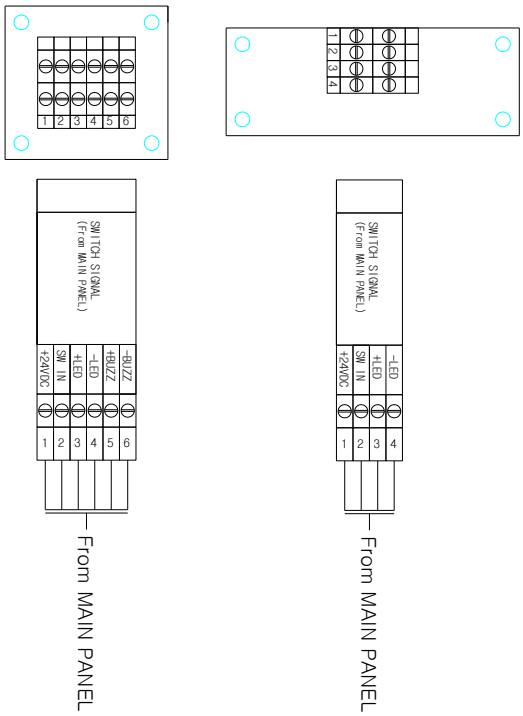

Fig. 3.11 Wing Reset Switch, Reset Switch 단자 (terminal)

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3.2.5. Junction Box Board

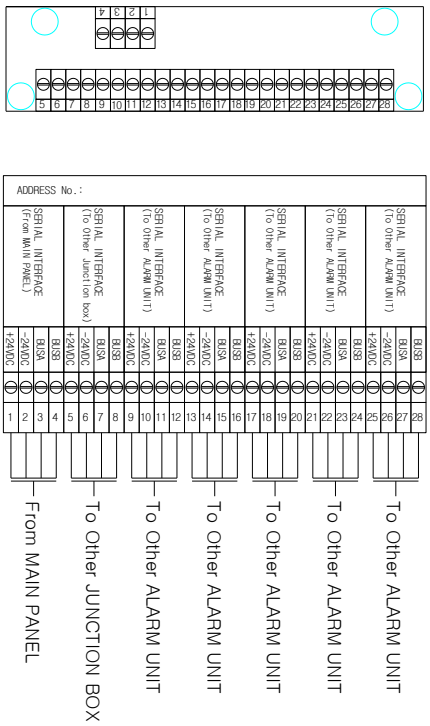
ADDRESS No.:
SERIAL INTERFACE (From MAIN PANEL)
SERIAL INTERFACE (To Other Junction box)
SERIAL INTERFACE (To Other ALARM UNIT)
SERIAL INTERFACE (To Other ALARM UNIT)
SERIAL INTERFACE (To Other ALARM UNIT)
SERIAL INTERFACE (To Other ALARM UNIT)
SERIAL INTERFACE (To Other ALARM UNIT)
+24VDC
-24VDC
BUSA
BUSB
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
From MAIN PANEL
To Other JUNCTION BOX
To Other ALARM UNIT
To Other ALARM UNIT
To Other ALARM UNIT
To Other ALARM UNIT
To Other ALARM UNIT

Fig. 3.12 Junction Box Board 단자 (terminal)

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4. Address Setting

4.1.1. Alarm Unit 의 Address 설정방법 Address Setting Method of Alarm Unit

Alarm Unit 의 Address 는 1~12 까지 지정할 수 있으며, 2nd Stage Alarm 와 3rd Stage Alarm 도 설정을 할 수 있습니다.

Address of Alarm Unit can assign from 1~12, it can also set 2nd Stage Alarm & 3rd Stage Alarm.

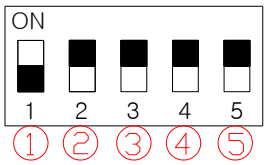

Fig. 4.1 Alarm Unit Dip Switch

① 스위치가 ON 방향으로 되면 Address 의 값 1 을 가지게 됩니다.
If the switch is On, it has value 1 of Address.

② 스위치가 ON 방향으로 되면 Address 의 값 2 을 가지게 됩니다.
If the switch is On, it has value 2 of Address.

③ 스위치가 ON 방향으로 되면 Address 의 값 4 을 가지게 됩니다.
If the switch is On, it has value 4 of Address.

④ 스위치가 ON 방향으로 되면 Address 의 값 8 을 가지게 됩니다.
If the switch is On, it has value 8 of Address.

⑤ 스위치가 ON 방향으로 되면 3rd Stage Alarm 으로 설정이 됩니다. ON 방향으로 되지 않으면 2nd Stage Alarm 으로 설정 됩니다.
If the switch is On, it will be set to 3rd Stage Alarm. If the switch is not On direction, it will be set to 2nd Stage Alarm.

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